

ABC implementation in the Nelson Mandela Bay Metropole: How far should manufacturing organisations go?

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ABSTRACT

Activity-based costing (ABC) success factors have been studied in past research, mostly by using commonly known success factors. In this qualitative study, a literature review and interviews were used to establish what factors are responsible for the successful implementation of ABC. The number of semi-structured interviews was limited to 13 ABC adopters in the Nelson Mandela Bay Metropole. The findings suggested that ABC can be enhanced with the use of activity-based budgeting (ABB) and activity-based management (ABM). In addition, the use of ABC in conjunction with capital investment decisions may ensure that correct decisions are made when critical long-term projects are considered. Extensive identification of cost drivers is beneficial to the extent where the product loses its relationship with the overhead cost. It is evident from this research that considering fixed indirect overheads in ABC is not always beneficial for a manufacturing organisation unless there is a clear link to the end-product.

Key words: activity-based costing (ABC), budgeting, implementation, success factors, metropole, capital investments, competition

Cooper and Kaplan (1988) introduced activity-based costing (ABC) as an alternative to traditional costing methods, which distort costs and in turn influence a company's competitive strategy. ABC has been praised in the literature as a costing methodology that provides improved product costing accuracy over traditional costing (TC) (Cagwin & Bouwman, 2002; Kee, 2003; Harrison & Killough, 2006; Cheng, 2013). Furthermore, the existence of other cost management tools such as activity-based budgeting (ABB) and activity-based management (ABM) are closely linked to ABC. ABM is a zero-based budgeting method that uses ABC principles (Abdel-Kader &

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Luther, 2006), while ABM relates to the management of cost activities (Armstrong, 2002). Although some literature has investigated or described ABC implementation success factors (Nolan, 2004; Nasser, Morris, Thomas & Sangster, 2009; Fei & Isa, 2010; Al-Omiri, 2011; Khozein, Dankoob & Barani, 2011; Appah & Bariweni, 2013; Rahmouni & Charaf, 2013), none of these research studies has attempted to explore user perceptions. Instead, they tested existing theories quantitatively. Fei and Isa (2010) suggest that because of cultural differences between developed and developing countries, ABC research should be extended to developing countries. This may suggest that international research on ABC implementation may not be applicable to the South African context, and combined with the lack of ABC success factor studies in South Africa, may have resulted in a research gap. In the next section, the research problem is presented followed by an outline of the objectives in an attempt to narrow the research gap. This will be followed by a discussion on how the findings of this research could contribute to the existing literature. A literature review is followed by a description of the methods used in the empirical study. The findings of the empirical study are then presented. This is followed by a discussion and conclusion, and the article ends with recommendations and suggestions for possible future research.

Research problem

The main research problem in this study is the lack of understanding of those ABC employment factors influencing ABC implementation success. Specifically, a research gap exists in terms of factors that influence ABC implementation success, especially in South Africa. As far as could be established, there are only a few empirical studies on ABC in South African literature. The most recent study by Rundora, Ziemerink and Oberholzer (2013) involved a survey of ABC users and non-users in small manufacturing organisations and found that ABC is perceived more favourably by users. Sartorius, Eitzen and Kamala (2007) conducted a survey study on ABC adoption in South Africa on larger JSE-listed organisations. They also identified five ABC success factors. However, these were high-level success factors and did not establish how ABC should specifically be employed to maximise success.

Objective of the article

The primary objective of this article was to explore whether the level of the employment of ABC from a user perspective impacts the implementation success of ABC. This research specifically attempted to

- determine the degree of visibility of costs in the ABC system and how it influences ABC implementation success
- identify practical issues preventing ABC from being used optimally
- establish whether ABC can be employed to gain a competitive advantage and benchmark, and what the impact is on the successful implementation of ABC
- determine whether ABB and ABM can assist in the successful implementation of ABC
- determine the role of ABC in capital investment decisions and how it influences the successful implementation of ABC

Research contribution

The findings of this research could provide manufacturing organisations with valuable ideas on or insights into the implementation of ABC. Since ABC is deemed to be more resource intensive than TC, it may be imperative for manufacturing organisations to consider these factors before implementing ABC. In addition, the use of a qualitative framework may enable future researchers to consider these factors in order to establish a correlation between success factors and ABC implementation success by means of a quantitative study.

To achieve the objectives, a literature review and empirical study consisting of semi-structured interviews were conducted. The next section deals with the literature review.

Literature review

Akyol, Tuncel and Bayhan (2005) and Walker and Wu (2000) used case studies to observe the effectiveness of intensive ABC application in product costing. These studies showed that intensive ABC models with multiple cost drivers can be provided for costing that may be more visible and accurate than low key ABC or TC. Similarly, Nasser *et al.* (2009) established that successful implementation of ABC in organisations is better with higher ABC employment levels. However, while these authors suggest that ABC becomes more effective with an increased level of employment of ABC, other studies (Armstrong, 2002; Kaplan & Anderson, 2003) noted that this may not always be possible and prevents ABC from being used as intended.

The principal issue preventing higher ABC employment levels seems to be the allocation of fixed indirect costs. It appears that for practical reasons, fixed indirect costs are often excluded from ABC product cost calculations (Gunasekaran, 1999;

Armstrong, 2002). Armstrong (2002) found that even in staff department activity allocations, there are some indirect portions which may vary between departments, and suggests that the accuracy of staff department activity allocations depends on the degree of indirect costs in the activity allocations. Gunasekaran (1999) postulates that it is difficult to have a direct link between products and indirect overheads and this may prove to be a disadvantage of ABC. However, he advises that ABC organisations should as far as possible attempt to include all indirect costs in the product cost calculation. Sartorius *et al.* (2007) suggest that many organisations in South Africa reject ABC because of the difficulty of assigning cost drivers for indirect fixed overheads. It is plausible that manufacturing organisations with a large indirect overhead structure may have difficulty implementing ABC and that this may be a limiting factor in ABC implementation success.

Furthermore, Charles and Krumwiede (2011) found that an organisation that emphasises a low price strategy obtains improved results when ABC is used to combat competitors' pricing strategies. They found that organisations that use a low-price strategy are more likely to benefit from ABC than organisations that employ a different strategy such as a flexibility strategy or limited commitment to any strategy. In addition, they found that the use of ABB may enhance ABC implementation success when combined with a low-price strategy. Shane (2005) suggests the use of ABB, because it may allow organisations to reveal non-value-adding activities and may help to identify unused capacity. He furthermore suggests that by using ABB organisations may be able to identify the cause of activity costs as opposed to only the effect. According to Abdel-Kader and Luther (2006), ABB may even be used in organisations despite the fact that they mainly use TC. While ABB may be used in the short-term operational planning of a manufacturing organisation, there is also further scope to use ABC as part of capital investment decisions. Furthermore, Armstrong (2002) describes the additional use of ABM to manage and control activity costs as a means of providing accountability. This may suggest that ABB, ABM and capital investment decision making with ABC are likely to be essential for ABC implementation success, that is, if the benefit is evident.

Lind (2001) compared the results of using TC and ABC as part of the capital investment process in the coal mining industry in South Africa. He found that there were significant differences between net present value (NPV) calculations between the two costing methodologies. Although Lind (2001) does not suggest that ABC is the only correct way of establishing a correct NPV, the results of the study indicate that organisations may need to consider different costing methodologies when making capital investment decisions. Similarly, Tsai, Chen, Liu, Chen and Shen (2011) found that owing to a lack of consideration of indirect overheads in the use of

TC with capital investment decisions, certain projects may be rejected with TC but accepted with ABC, which may result in loss of potential profits. They also found that projects deemed to have a favourable NPV with TC may be rejected with ABC, and vice versa. Hence organisations may need to take cognisance of the effect that capital investment decisions may have with both methods.

The next section explains the research and sampling method used in this research.

Method

The research was conducted in a qualitative research paradigm using an exploratory research design. A comprehensive literature review was first conducted. To determine whether the level of employment of ABC in manufacturing organisations influences the successful implementation of ABC, semi-structured interviews with ABC users were conducted. Marshall and Rossman (2011) suggest the use of an exploratory research design if the intention is to discover phenomena for future hypothesis testing. Hence the intention of these findings was to potentially provide a research framework for future studies. The sample of participants was drawn from manufacturing companies in the Nelson Mandela Bay Metropole. This area is regarded as the automotive hub of South Africa but also includes several manufacturing concerns from other industries. The reason for selecting the Nelson Mandela Bay Metropole was twofold – (1) to assist manufacturing organisations in the Metropole in successfully adopting ABC, thereby fostering sustainability; and (2) to encourage new business in the Metropole by virtue of economic success of existing manufacturing organisations. The Nelson Mandela Bay Business Chamber (NMBBC, 2013), the largest business directory of Nelson Mandela Bay businesses, was used as a starting point to solicit participants for the research study. Purposive, homogeneous sampling was used to obtain a sample of 18 organisations using ABC. These organisations were identified by contacting (telephone or e-mail) all manufacturing organisations listed on the NMBBC. The organisations were asked to indicate if they use ABC and if they would be willing to participate in the research. An interview plan was prepared with questions relating to the research objectives. Additional questions were asked in response to answers from participants. Interviews were continued until the point of data saturation had been reached and no more new findings were revealed, as suggested by Remenyi (2012). After 13 interviews, data saturation was reached and no more interviews were conducted.

The interviews were conducted at the participant's place of work, with an average duration of 45 minutes. The interviews were recorded with a digital voice recorder with field notes where necessary. The digital voice recordings were transcribed by

a transcription professional. Deductive qualitative content analysis (Kumar, 2011) was used to analyse the data. The analysis was conducted using the transcripts of the 13 semi-structured interviews. Each code (or theme) was derived deductively from the objectives. The following section focuses on the major findings of the semi-structured interviews.

Findings

The findings were classified and discussed according to the following themes:

1. The degree of visibility in the ABC system and level of use
2. Practical issues preventing ABC from being used optimally
3. Using ABC to gain a competitive advantage and benchmarking
4. Using ABB in support of ABM
5. The use of ABC in capital investment decisions

The degree of visibility in the ABC system and the level of use

This section discusses ABM and ABC implementation, cost visibility and profitability information.

ABM and ABC implementation

The rigorous use of ABM was deemed important by the participants because of its ability to be used as an activity-monitoring system allowing room for efficiency improvements. This is achieved by comparing activity costs/outputs against previously measured costs, thereby monitoring activity performance. One participant suggested that increased ABM use may enable an organisation to identify spare capacity. Some participants suggested that these activities should be understood across the entire value chain. In general, the findings of these participants agreed with those of Armstrong (2002) and Kumar and Mahto (2013), who suggested that the use of ABM may enhance the use of ABC. Participants felt monitoring ABC allows organisations to attend to any activity variances immediately. Generally, the findings revealed that with increased cost monitoring with ABC, the costs are more visible.

Cost visibility

According to the participants, the use of the low transparency TC system does not allow for sufficient cost transparency. The participants argued that because of

reduced accuracy, the focus could be on the wrong product families. In addition, this could result in a lack of confidence in the profitability numbers and that explaining profit deviations and variances may become problematic, echoing the findings of the research of Cokins (2002) and Nolan (2004). It was also suggested that if the product mix were to change significantly, it could result in a loss of profits. One participant also suggested that ABC should be used on an ongoing basis and not merely as an ad hoc exercise to ascertain product costs. However, it was recommended that in some organisations with a low product mix complexity it may not matter as much. In general, the participants suggested that even though limited cost visibility may suffice in the short term, it is likely to be detrimental over a longer period. It is plausible that cost visibility through the use of ABM and ABC results in decisions on which product families to manufacture, which ultimately leads to better profitability.

Profitability information

Some participants considered the ability of ABC to provide profitability information on different hierarchal levels as crucial. According to the participants, the purpose is to identify effective contributors at a hierarchal level and extend the focus to these sets of products by aiming at increasing volumes. Conversely, it allows organisations to focus on poorly contributing product families by improving efficiencies and reducing costs. In addition, the use of ABC in pricing negotiations was promoted by participants, given the fact that costing was sufficiently transparent to be utilised as a bargaining tool. This approach is similar to that of Nolan (2004) who illustrated how hierarchal analysis can be used to identify profitability at different levels such as customer, product family and product level, and taking action-based decisions on the strength of these revelations. Ultimately, what participants seemed to want is an ABC system transparent enough to allow them to pinpoint effective and poor contributors to be able to make correct decisions about product mix and focus areas. Hence this could be a key aspect of ABC to consider during implementation.

Practical issues preventing ABC from being used optimally

Although the majority of participants agreed that the intensive implementation of ABC provides benefits over TC, the findings of the research suggest that the extent of ABC employment may be limited to what remains practical in an organisation.

Straining resources and deflecting the focus

According to Armstrong (2002) and Kaplan and Anderson (2003), excessive ABC implementation might actually be detrimental to the organisation by overextending resources and not allowing the organisation to focus on its core business activities. In practice, it would seem that a combination of ABC and TC could be the extent to which ABC is implemented for some organisations in that it allows activity cost monitoring while remaining practical. The grouping of activity costs or arbitrary allocations for some overhead costs such as between shared lines was suggested as a method to simplify ABC implementation. Excessive overhead allocation seems to create unnecessary frustration beyond the point where the product loses its relationship with the overhead cost. Still, some participants were keen to increase their focus on ABC, but were hampered by a lack of resources or skills. It may therefore be necessary for organisations to take cognisance of available resources when deciding on ABC implementation in order to achieve the most benefit. The participants did not advise spending excessive time and resources on allocating costs where other value-adding activities could have been performed. The researchers learnt from participants that attempting to attribute indirect fixed overheads to products is problematic and is likely to add little value for manufacturing organisations. As one participant noted, it is likely that costs that are of least significance could involve the most effort in allocating these costs. However, it was noted that although allocating indirect overheads is problematic, some participants deemed it important, especially with significant changes in a fixed overhead structure. Even Sartorius *et al.* (2007) indicated that there are attempts to allocate semi-direct costs such as warehousing costs by means of a specific driver. Allocating indirect functions with ABC were deemed to be more important in organisations with dedicated personnel focusing on specific product families only.

Input errors and accuracy

Finally, the accuracy of input data was observed by participants as a factor that influences the plausibility of cost information with ABC. According to the participants, errors in input data are made during pressure time and that this could result in incorrect profitability numbers. Consequently, the organisation may end up focusing on the wrong activity areas. The accuracy of the ABC system is therefore suggested as significant in preventing the attempt to explain non-existing variances. This confirms the findings of Xu (2012).

The overriding impression gained from the participants was that although it is preferable to implement ABC as intensively as possible, it may not always be possible. While the allocation of manufacturing overheads as best as possible would be key,

the use of ABC to allocate indirect fixed manufacturing overheads is not always proposed. Ensuring the accuracy of base data may also enable manufacturing organisations to accurately represent ABC profitability information.

Using ABC to gain a competitive advantage and benchmarking

The use of ABC to gain a competitive advantage was considered to be advantageous to ABC implementation success. The key for these organisations seems to be to implement ABC intensively enough to understand the exact nature of their overheads with a view to gaining a competitive advantage. The participants mentioned that ABC allowed them to compete more efficiently with the increase in cost visibility with ABC. A low level of employment of ABC was deemed inappropriate for organisations to compete effectively.

Selling price strategies and decreasing operating costs

The participants identified two methods of gaining a competitive advantage. While adopting selling pricing strategies with knowledge gained from ABC was deemed important, according to participants, it is not always possible. However, where possible, it may be a useful tool to ensure that the organisation remains competitive. The second strategy used by participants was to drive down operating costs by endeavouring to understand the underlying activities relating to the product costs. The findings of Velmurugan (2010), Charles and Krumwiede (2011) and Yapa and Konchange (2012) confirm this. According to Bogdănoiu (2009), ABC helps organisations to answer the market need for better quality products at competitive prices through the analysis of product profitability and customer profitability. The ABC method can therefore contribute effectively to top management's decision-making process. Most participants believe that accurate costing increases their organisation's competitive position and that knowledge of their costing enables them to compete against other similar organisations. In contrast, some participants stated that it is impractical to use competitors' pricing strategies as a driver for ABC, and they believe that service and quality should be balanced with cost control in order to gain a competitive advantage and sustainability. Although the participants admitted that it is difficult to establish what competitors are doing in terms of own costing, a manufacturing organisation can look at its own processes and endeavour to lower its operating costs by improving inefficiencies. The general feeling among the participants was that competition and the need to sustain a competitive advantage encourage the use of ABC.

Using ABB in support of ABM

The use of ABB in support of ABM was deemed significant by the majority of participants, a view that supports the research of Shane (2005) and Abdel-Kader and Luther (2006), who suggested that ABB improves cost control and may identify non-value-adding activities. The majority of participants did not practise this, although most of them suggested that it would be under consideration. It was felt that in order to be fully effective, a large portion of the overhead budget needs to be zero based and that a primarily historically based budget might not suffice. Nevertheless, an entire zero-based budget was not considered practical and certain fixed costs may need to be carried over from previous periods. Some participants suggested that in order for ABB to succeed it may be necessary to measure activity drivers prior to the budget process, if such measures are not already in existence.

One consideration mentioned by the participants was that these measurements should be consistent and that frequently changing the measurement criteria might prevent manufacturing organisations from effectively managing these activities. Despite the perceived benefits of ABB, some participants did admit that the complexity of ABB prevented them from utilising it intensively. This is countered to some extent by the grouping of activity budgets for similar product ranges. Generally, however, the use of ABB in conjunction with ABM was regarded as essential and it might be necessary for manufacturing organisations to consider a practical application of ABB to support ABM based on the available resources.

The use of ABC in capital investment decisions

The majority of participants were in favour of using ABC as part of the capital investment decisions and believed that this could enhance the successful implementation of ABC when benefits are realised. These suggestions concur those of with Lind (2001) and Tsai *et al.* (2011) who established an improvement in NPV when ABC, as opposed to TC, is used. According to some of the participants, profit margins and product quality can be improved if the correct capital investment decision is made. In addition, it was suggested that ABC may help to identify poorly performing equipment, therefore further justifying a capital investment decision. However, according to the participants, the key is to be able to identify key drivers for the proposed investment to ensure the accuracy of the NPV calculation. The use of time studies was deemed necessary to be able to identify these drivers and could help to establish standards for future comparisons. Most of the participants believed that these comparisons can be used to evaluate products throughout their lifetime to

ensure that the initial profitability level is maintained and that there is continuous improvement.

One participant noted that the use of automated measuring equipment could provide activity data that is readily available. This was suggested to be preferable to ad hoc measurements because these could incorporate natural inefficiencies. Another participant suggested the use of an off-line database with records of obsolete products that could provide the basis for new capital investment calculations. Although the majority of participants were in favour of the use of ABC for capital investment decisions, some of them stated that it was not used in their respective organisations or was deemed to be impractical. One participant believed that capital investment decisions should not be based on ABC, but viewed instead as a strategic decision and the use of ABC to manage costs. In general, however, most of the participants regarded the use of ABC with capital investment decisions as advantageous. The participants also endorsed it as a useful tool to track NPV across the entire product life cycle and one to be used in conjunction with ABM.

This concludes the general discussion of the findings. The findings are represented diagrammatically in Figure 1. In addition, a summary of the major findings of this research study is tabled as an appendix. The following section discusses the results and the conclusions drawn from the research.

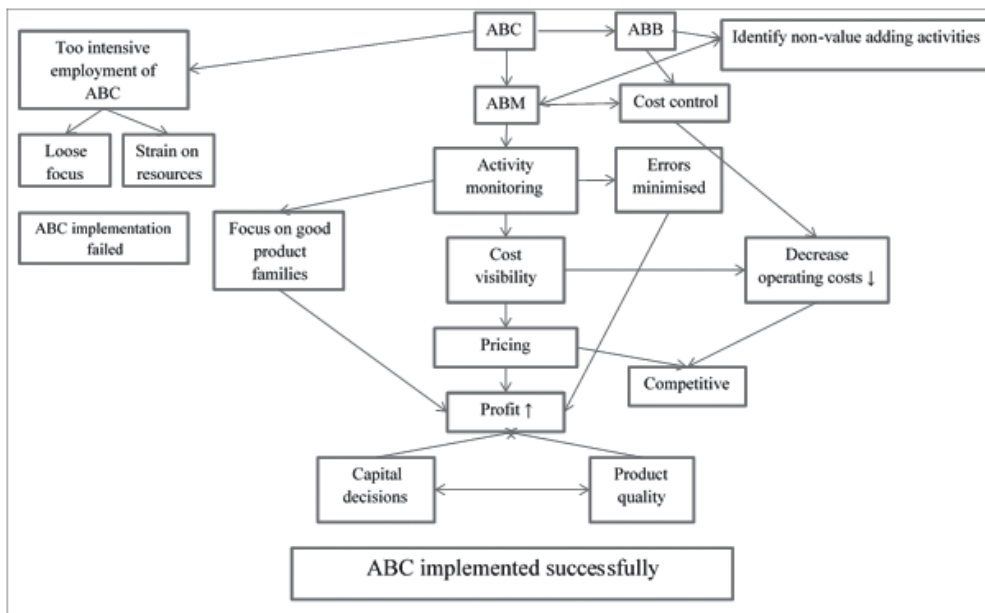


Figure 1: Summary of findings

Discussion and conclusions

It was established in the research that full ABC implementation may not always be achievable. The research suggests that ABC may only be practical in manufacturing organisations to the point where the product loses its relationship with the overhead cost. Most manufacturing organisations seem to use a substantial arbitrary allocation basis, despite ABC implementation. The participants suggested that ABC does not consider idle capacity, and with fluctuating volumes, this could prove to be problematic with the allocation of fixed manufacturing overheads. However, Cooper and Kaplan (1992) indicated that ABC addresses resource consumption and not the supply of resources, thus disagreeing with the views of the respondents. The use of a product profitability analysis at different hierarchical levels, as suggested by Nolan (2004), may enable manufacturing organisations to identify low margin products and perhaps drive their strategy towards high-profit product lines or customers. This would probably not be practical, based on the research, but could provide manufacturing organisations with profitability information that could assist with long-term strategic planning.

The participants suggested that it may not always be possible to increase selling prices because of newly found ABC product costing information. Instead, most organisations would focus on achieving improved efficiencies with the use of ABM and ensure that internal resources would be used optimally. This could result in a decrease in operating costs and subsequent improved margins. In addition, the use of benchmarking was cited by the participants as being essential to gain a competitive advantage and adhere to best standards.

The use of ABB to support ABC was considered beneficial by participants to ensure an accurate comparison basis for ABM. It was deemed important to compare actual activity costs with budgeted activity costs to ensure that profit margins are not eroded. Despite this, for practical reasons, the majority of the participants did not actively use ABB. Although they mostly suggested using historical costs as a starting base for practical reasons, they did acknowledge that a large portion of the budget should be zero based in order to eliminate past inefficiencies. A practical solution that was proposed would be to simplify ABB by grouping activity outputs according to product family or business unit and to assign overhead costs at that level. The research suggested that it might be necessary for manufacturing organisations to ensure that similar measuring standards are used between business units. This could help to ensure comparability and accountability between these business units. Most of the participants considered the use of ABC as part of the capital investment process as a vital tool. However, it was evident that ABC was not widely adopted by the organisations interviewed. A significant finding of the research was that historical

activity data for similar product families could help to accurately incorporate ABC in the NPV calculation. Failing that, the participants believed that time studies are imperative prior to deciding on an investment opportunity.

The following conclusions were drawn from the research:

Objective 1: To establish the degree of visibility of costs in the ABC system and how this influences ABC implementation success

The ability of ABC to be transparent could enhance the success of ABC implementation. This would be possible if profitability numbers were visible at different hierarchal levels and activities could be traced across the entire value chain. The use of ABM could also ensure the success of ABC implementation in manufacturing organisations by providing a mechanism for managing activity costs. The likelihood of ABC implementation success in manufacturing organisations could be maximised with increased identification of cost drivers for manufacturing overheads, thus increasing profitability.

Objective 2: To identify practical issues preventing ABC from being used optimally

Excessive identification of indirect fixed overheads may be disadvantageous for ABC implementation success in manufacturing organisations because of possible time and resource constraints. Excessive focus on ABC could be detrimental and there may be a point where the incremental benefit does not justify the additional effort. Finally, the participants viewed the accuracy of input data as a factor that influences the plausibility of cost information with ABC. According to the participants, errors in input data are made during pressure time, which might result in incorrect profitability numbers.

Objective 3: To establish whether ABC can be employed to gain a competitive advantage and to benchmark, and the possible impact of this on the successful implementation of ABC

Most of the participants believed that accurate costing increases their organisation's competitive position and that knowledge of their costing enables them to compete against other similar organisations. The general feeling of the participants was that competition and the need to sustain a competitive advantage encourage the use of ABC.

Objective 4: To establish if ABB and ABM can assist with the successful implementation of ABC

The use of ABB may enhance ABC implementation success in manufacturing organisations by providing comparability with budgeted standards. The use of ABB in conjunction with ABM was considered essential, and it might be necessary for manufacturing organisations to consider the practical application of ABB to support ABM based on available resources.

Objective 5: To establish the role of ABC in capital investment decisions and how it influences the successful implementation of ABC

Capital investment decisions using ABC in manufacturing organisations might ensure that correct decisions are made and provide a basis for comparability throughout the product life cycle.

Recommendations and suggestions for future research

The researchers recommended that ABC implementation should be combined with ABM, ABB and capital investment decisions. However, the selection of activity drivers for manufacturing overheads should probably be restricted by what is practical in any particular manufacturing organisation. Despite this, the intention should be to identify activity drivers for manufacturing overheads to the maximum extent, and it would therefore be advisable for groups of companies to establish activity driver standards nationally and internationally. This is likely to be a standard that could be used globally to facilitate comparisons with similar plants. Conversely, it would seem that significant efforts to identify activity drivers for indirect fixed overheads may be counter-productive and that overheads that cannot be traced to products should not be included in product costing. These costs should therefore be excluded or absorbed using an arbitrary rate such as cost per labour hour for all products. The use of ABB and ABM may be essential for setting activity standards and managing activity standards. Manufacturing organisations may also need to consider using ABC for important capital investments using data collected from ABM to ensure an accurate NPV calculation. In conclusion, manufacturing organisations should consider their individual circumstances when deciding on ABC implementation intensity. Successful ABC implementation may be achieved by organising organisational resources to the extent where ABC remains practical using theory as a guideline.

It is suggested that future research attempts should be made to quantitatively establish a relationship between these findings and ABC implementation success in South Africa. These relationships may further assist manufacturing organisations in South Africa in establishing how intensively ABC needs to be implemented.

Finally, the results of this research should enable manufacturing organisations in South Africa to better understand the factors preventing them from successfully employing ABC and ultimately to be more competitive and foster a stronger South African economy.

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Appendix: Summary of findings

Factors	Finding : Effect on ABC implementation	Reason(s) cited	Past research	Confirmatory finding from participants
Visibility	ABC implementation success may be enhanced when profitability information is more readily available	<ol style="list-style-type: none"> Hierarchical analysis may allow organisations to focus on specific customers or product families If activities can be identified at different stages during the value chain, this may enhance ABC implementation success 	Cokins, 2002 Nolan, 2004	[1], [2], [3], [4], [10], [12]
ABM	The use of ABM may enhance the efficiency of the ABC	<ol style="list-style-type: none"> ABM may assist organisations in managing activity costs that may result in loss of profitability The use of standards across the organisation may supplement ABM by providing comparability within the organisation 	Armstrong, 2002; Kumar & Mahto 2013	[1], [2], [3], [4], [5], [6], [10], [11]
Extent of ABC focus	Excessive focus on ABC may result in diminishing returns	<ol style="list-style-type: none"> Excessive allocation of cost drivers may not be justifiable if it results in an increase in resources Some areas may not benefit at all from intensive ABC even within the same organisation 	Armstrong, 2002; Kaplan & Anderson, 2013	[1], [2], [3], [4], [5], [10], [13]
Extent of indirect fixed OH allocation	<ol style="list-style-type: none"> Lack of consideration of indirect fixed overheads may result in distortion of product costs Excessive focus on indirect fixed overheads may be of little value if overhead cost can not be traced to individual products Traceability of indirect fixed overheads may be simplified if support functions are divided into product specific areas 	<ol style="list-style-type: none"> Activities relating to indirect overheads may vary between product families and could have a significant effect on product costing Excessive allocation of cost drivers for indirect fixed overheads may result in a substantial increase in resources required 	Armstrong, 2002; Kaplan & Anderson, 2013	[1], [2], [3], [4], [5], [6], [9], [10], [11], [13]

Factors	Finding : Effect on ABC implementation	Reason(s) cited	Past research	Confirmatory finding from participants
Extent of manufacturing OH allocation	The accuracy of product costing with ABC may be improved with substantial identification of manufacturing overhead cost drivers	Arbitrary allocations of manufacturing overhead costs may result in a decrease in product cost accuracy	Akyol <i>et al.</i> , 2055; Walker & Wu, 2000	[1], [2], [3], [4], [6], [7], [8], [9], [10], [11], [12], [13]
Accuracy of source data	ABC implementation success will likely improve with increase reliability of source data	The reliability of source data may effect the accuracy of the ABC costing model.	Zu, 2012	[1], [10], [12]
Strategy & ABC	ABC implementation success may be enhanced when considered as part of the organisations competitive strategy	Activity costs could be managed by ABM, allowing organisation to either lower its price to become more competitive or increase its price to prevent losses on product families	Charles & Krumwiede, 2011; Veilmurugan, 2010; Yapa & Konchange, 2012	[2], [3], [6], [7], [8], [9], [13]
ABB	ABB may enhance ABC implementation success	<ol style="list-style-type: none"> 1. ABB assists in identifying activity cost standards that may supplement ABM in managing these activity costs 2. ABB assists in identifying non-value adding activities which could be managed with ABM 3. The effectiveness of short-term decision-making with ABC may be enhanced if activity costs are flexed in line with operational requirements 	Kee, 2003; Shane, 2005	[1], [2], [3], [5], [6], [9], [10], [11], [13]
Capital investment decisions	The effectiveness of capital investment decision-making may be enhanced if ABC is considered for the NPV calculation	<ol style="list-style-type: none"> 1. Significant differences in product costs between TC and ABC when NPV is calculated for large investments may have a significant impact on the organisations 2. Product life-cycle costing with ABC may ensure profit margins are not eroded by identifying activities that has changed over time 	Lind, 2001; Tsai <i>et al.</i> , 2011	[1], [2], [3], [4], [5], [6], [9], [10], [12], [13]